The Investigation of Rubella Seroprevalence in Pregnant Women in Kars

Eurasian Clinical and Analytical Medicine Original Research

Rubella Seroprevalence in Pregnant Women

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Abstract

Aim: Although Rubella (German measles) is a mild, viral infection which often seen in children and can be prevented by a vaccine, it can cause serious anomalies in the fetus when infection occurred during pregnancy. In this study, we aimed to investigate the seroprevalence of antibodies against the rubella virus in pregnant women in the risk group who were admitted to Kafkas University Department of Obstetrics and Gynecology and Kars Government Hospital between 01.01.2012 and 31.05.2015.

Material and Methods: In this study, serum Rubella IgG results were investigated retrospectively in 15 to 45 years old 2917 pregnant women who admitted to Kafkas University Department of Obstetrics and Gynecology and Kars Government Hospital, between 01.01.2012-31.05.2015. Rubella IgG antibodies were measured by the Enyzme Linked Immunosorbent Assay (ELISA) method in the patients serum. Rubella IgG antibodies values were considered positive for over 10 IU/mL.

Results: The mean age of the study participants was found to be 27.1 ± 6,1. 178 (6,1%) patients were considered as seronegative in terms of serum rubella IgG level, whereas 2739 (93,9%) patients were seropositive.

Discussion: It was detected that Rubell IgG seronegativity rate was 6,1% in pregnant women. Childbearing age women who had not a history of infection and no vaccination are at risk. It is important to vaccinate women prior to pregnancy and after pregnancy if seronegative women diagnosed during pregnancy, in terms of providing protection against congenital rubella syndrome. Mortality and morbidity due to congenital rubella syndrome can be reduced by vaccinating women who apply to make laboratory tests before marriage.The data obtained in this study is going to be important for the evaluation of effectiveness of Measles Mumps Rubella vaccine which was included in the routine childhood immunization schedule in 2006.

Keywords

Rubella; ELISA; Congenital Rubella Syndrome

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Introduction

Rubella, also known as German measles or three-day measles, is an infection caused by the rubella virus[1]. Rubella virus is the only member of the genus Rubivirus and belongs to the family of Togaviridae, whose members commonly have a genome of single-stranded RNA of positive polarity which is enclosed by an icosahedral capsid. The virus is transmitted by the respiratory route and replicates in the nasopharynx and lymph nodes. The virus is found in the blood 5 to 7 days after infection and spreads throughout the body. The virus has teratogenic properties and is capable of crossing the placenta and infecting the fetus where it stops cells from developing or destroys them[2].

Rubella can cause congenital rubella syndrome in the newborn. The syndrome (CRS) follows intrauterine infection by the rubella virus and comprises cardiac, cerebral, ophthalmic and auditory defects[3]. It may also cause prematurity, low birth weight, and neonatal thrombocytopenia, anemia and hepatitis. The risk of major defects or organogenesis is highest for infection in the first trimester. CRS is the main reason a vaccine for rubella was developed[4]. Many mothers who contract rubella within the first critical trimester either have a miscarriage or a still born baby. If the baby survives the infection, it can be born with severe heart disorders (Patent ductus arteriosus being the most common), blindness, deafness, or other life-threatening organ disorders. The skin manifestations are called "blueberry muffin lesions"[4]. For these reasons, rubella is included on the TORCH complex of perinatal infections. About 10,000 cases of this condition occur each year[5].

Rubella virus specific IgM antibodies are present in people recently infected by Rubella virus but these antibodies can persist for over a year and a positive test result needs to be interpreted with caution. The presence of these antibodies along with, or a short time after, the characteristic rash confirms the diagnosis[6].

Rubella infections are prevented by active immunisation programs using live, disabled virus vaccines. The vaccine is now usually given as part of the MMR vaccine. The WHO recommends the first dose be given at 12 to 18 months of age with a second dose at 36 months. Pregnant women are usually tested for immunity to rubella. Women found to be susceptible are not vaccinated until after the baby is born because the vaccine contains live virus[7]. Screening for rubella susceptibility by history of vaccination or by serology is recommended in the United States for all women of childbearing age at their first preconception counseling visit to reduce incidence of congenital rubella syndrome(CRS) [8] . It is recommended that all susceptible non-pregnant women of childbearing age should be offered rubella vaccination[8]. Due to concerns about possible teratogenicity, use of MMR vaccine is not recommended during pregnancy[8]. Instead, susceptible pregnant women should be vaccinated as soon as possible in the postpartum period[8].

There is no specific treatment for Rubella; however, management is a matter of responding to symptoms to diminish discomfort. Treatment of newborn babies is focused on management of the complications. Congenital heart defects and cataracts can be corrected by direct surgery[9]. Management for ocular congenital rubella syndrome (CRS) is similar to that for age-related macular degeneration, including counseling, regular monitoring, and the provision of low vision devices, if required[10].

The purpose of this study was to determine the seroprevalence of Rubella infection, which usually passes as a mild disease despite the serious consequences during pregnancy, among pregnant women in Kars.

Material and Methods

Rubella IgG results in 2917 pregnant women who admitted to Kafkas University School of Medicine-Department of Obstetrics and Gynecology and Kars State Hospital, between the ages of 15-45 were retrospectively investigated in the period from January 2012 to May 2015. Rubella IgG antibodies in blood samples were analyzed by Enzyme Linked Immunosorbent Assay (ELISA) method.

Results

A mean age of 2917 pregnant women who enrolled to our study was found 27.1± 6.1 years old (age range was 15-45). In our study, the Rubella IgG result was negative in 178 out of 2917 (6.1%) serum example and was positive in 2739 out of 2917 (93.9%) serum samples.

Discussion

Rubella was first described in the mid-eighteenth century. Friedrich Hoffmann [11] made the first clinical description of rubella in 1740, which was confirmed by de Bergen [12] in 1752 and Orlow in 1758. In 1814, George de Maton [13] first suggested that it be considered a disease distinct from both measles and scarlet fever. All these physicians were German, and the disease was known as Rötheln (contemporary German Röteln), hence the common name of "German measles". Henry Veale, an English Royal Artillery surgeon, described an outbreak in India. He coined the name "rubella" (from the Latin word, meaning "little red") in 1866[11, 14-16].

Rubella is a disease that occurs worldwide. The virus tends to peak during the spring in countries with temperate climates. Before the vaccine to rubella was introduced in 1969, widespread outbreaks usually occurred every 6–9 years in the United States and 3–5 years in Europe, mostly affecting children in the 5-9 year old age group[17]. Since the introduction of vaccine, occurrences have become rare in those countries with high uptake rates.

Vaccination has interrupted the transmission of rubella in the Americas: no endemic case has been observed since February 2009. Since the virus can always be reintroduced from other continents, the population still need to remain vaccinated to keep the western hemisphere free of rubella. During the epidemic in the U.S. between 1962–1965, rubella virus infections during pregnancy were estimated to have caused 30,000 still births and 20,000 children to be born impaired or disabled as a result of CRS[18,19]. Universal immunisation producing a high level of herd immunity is important in the control of epidemics of rubella[20].

The elimination of rubella and prevention of CRS program has been carried out in Turkey since 2006. Children were included in routine vaccination in our country since 2006

With the help of both vaccination as well as surveillance and social mobilization activities, the elimination period had started, but our country has become a target for importations increasingly[21]. Importations can not be prevented in recent years because of the emigration from Syria.

Different studies have been done in pregnant women in Turkey demonstrate that rate of protective antibodies against rubella was ranging from 95.5% to 82% [22-26]. In our study, this rate was found to be 93.9% which was similar to the other studies. This seropositivity thought to be the result of natural infection in childhood.

In this study, 178 patients (6.1%) were found to be seronegative for rubella. These women are at risk for rubella infection and CRS during pregnancy. It is known that immunity against rubella is vary in terms of age, socioeconomic status and geographic region. Results of various studies in our country showed that 10-15% of women of childbearing age were seronegative for rubella [27-29].

Even though there is no clear information about Rubella seronegativity in our region, our study result seems to be low according to the available literature. This may indicate the effectiveness of using routine vaccination schedules. We think that data obtained with this study would be important in the coming years for the evaluation of the effec-

tiveness of mumps, measles and rubella vaccine which were included in the childhood routine immunization schedule.

In conclusion, the advantages of widespread and effective implementation of children vaccination programs, vaccination of the seronegative young girls and mothers before pregnancy and vaccination of seronegative pregnant women after pregnancy were very clear in terms of providing protection against rubella virus.

Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and human rights statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

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Conflict of interest

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